

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

(PROPOSED)

Title V / Synthetic Minor, Construction / Operating

Permit: V-07-039

Stanton Compressor Station

Stanton, KY 40380

January 7, 2008

Luis D. Fuentes, Reviewer

SOURCE ID: 21-197-00006

AGENCY INTEREST: 44369

ACTIVITY: APE20070002

**SOURCE DESCRIPTION:**

Columbia Gulf Transmission Company owns a compressor station in Stanton, Powell County, KY. Stanton Natural Gas Transmission Station receives natural gas via pipeline or from the storage facility and compresses, or transmits, the natural gas for transport to other locations via pipeline.

Equipment at this station includes:

- Four natural gas reciprocating engines (Cooper-Bessemer LSV-16, 4 stroke lean burn);
- One natural gas turbine & compressor (Pratt & Whitney GC3C-1);
- One natural gas-fired turbine (Solar Mars 100-T15000S); and
- One engine generator (660 HP-4 cycle engine).

The Stanton compressor station of Columbia Gulf Transmission currently operates under the authority of the General Permit Title V Operating Permit G-04-001 Revision 1. Permit No. V-07-039, is a single-source Title V permit being issued to this facility since a synthetic minor permit is necessary for this source. The original permit application for the natural gas-fired Solar Mars 100 turbine, emission unit 08 (EP 108), was based on manufacturer guaranteed minimum power output at an ambient temperature of 0° F and did not address turbine emissions during very cold weather (ambient temperature <0° F), during turbine startups/ shutdowns, and during periods of low load operation (transience shifts, <50% load and/or <90% NGP speed). At these operating conditions, CO and VOC emissions are higher than during normal operation. Potential emissions, based on the new operating condition information, are above the prevention of significant deterioration of air quality (PSD) significant emissions increase level. Therefore, the facility has requested synthetic minor limits to preclude the applicability of PSD.

**COMMENTS:**

a. Type of control and efficiency: None

b. Emission factors and their source:

Emission factors were obtained from the Gas Research Institute, manufacturer guarantees and AP-42.

c. Applicable Regulations:

Reciprocating compressors:

40 CFR 63 Subpart ZZZZ, National Emission Standards for Hazardous Pollutants for Stationary Reciprocating Internal Combustion Engines

Standby generators:

40 CFR 63 Subpart ZZZZ, National Emission Standards for Hazardous Pollutants for Stationary Reciprocating Internal Combustion Engines

Gas turbines:

401 KAR 60:005 incorporating 40 CFR 60 Subpart GG, Standards of Performance for Stationary Gas Turbines, by reference.

40 CFR 63 Subpart YYYY, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

d. PSD Netting Analysis:

On May 30, 2000, the facility completed a netting analysis for the removal of turbine 105 and installation of Emission Unit 08 (EP 108). Past actual emissions were based on 480 million standard cubic feet (mmscf) of fuel consumption in 1998 and 597 mmscf of fuel consumption in 1999.

Pollutant	Turbine 105 annual emissions (tpy)		Average emission (tpy) from Turbine 105	Potential Emission (tpy) from Turbine 108
	1998	1999		
<b>NOx</b>	84.5	105	94.7	91
<b>CO</b>	31.4	39.1	35.3	*65.7
<b>VOC</b>	0.6	0.8	0.7	1.9
<b>PM</b>	4.6	5.7	5.1	1.3
<b>SO2</b>	0.2	0.2	0.2	0.4

\*Potential emissions from emission unit 08 (Turbine 108) were based on normal conditions. Monthly operating records will be used to calculate monthly emissions of CO (Meco) using the following equation:

$$\text{Meco} = [\text{DLNco} * \text{DLN hrs}] + [\text{LLco} * \text{LL hrs}] + [\text{LTco} * \text{LT hrs}] + [\text{SSco} * \text{SS hrs}]$$

Where DLNco, LLco, LTco, and SSco are the unit emission rates (lb/hr) for CO during normal, low load, low temperature, and startup/ shutdown operation. Based on Solar data, the emission rates for the turbine in each of these modes are:

Turbine ID	DLNco (lb/hr)	LLco (lb/hr)	LTco (lb/hr)	SSco (lb/hr)
108	15.1 <sup>1</sup>	462.3 <sup>2</sup>	31.4 <sup>3</sup>	190.4

<sup>1</sup> Based on full load operation at 0 °F and 50 ppm CO at 15 % O<sub>2</sub>.

<sup>2</sup> Based on 50 % load at 0 °F and 2200 ppm CO at 15 % O<sub>2</sub>.

<sup>3</sup> Based on full load operation at -17 °F and 100 ppm CO at 15 % O<sub>2</sub>.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

CO emission from emission unit 08 (EP 108) shall not exceed 129 tons per year (tpy), to preclude the applicability of a PSD significant emission increase (401 KAR 51:017). Based on the review of past actual CO emissions from the removed turbine (EP 105) of 35 tpy, as documented in the May 2000 permit application for the Solar Mars turbine, and 94 tpy as 95 % of 100 tpy to ensure the continued non-applicability of PSD (CO increase of 100 tpy).

**PERIODIC MONITORING:**

Solar Mars Turbine (EP108)

The permittee shall daily monitor the duration of normal, low load, low temperature operating hours, and startup/shutdown operations. At the end of each month, monthly emissions will be summed for the preceding 12 months to determine compliance with the annual emission cap. The 12-month rolling emissions will be reported to the Division as part of the station's semi-annual monitoring report.

**OPERATIONAL FLEXIBILITY:**

NONE

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.